

REMARKS

Claims 1 to 23 are pending in this application. Claims 1-12 have been rejected. Claims 13-21 are withdrawn from consideration. Claims 1 and 10 are amended. Claims 22 and 23 are newly added herein.

A marked-up version of the amendments is appended hereto.

Amendment to the Specification

The specification is amended to update information concerning identification of the application incorporated by reference referred to at page 10, line 25 to page 11, line 2. Specifically, the serial number of the application is now set forth.

Response to Restriction Requirement

Restriction was required between the following groups of claims:

Group I - Claims 1-12, drawn to a process for activating a basic metal oxide olefin isomerization catalyst and catalyst thereof, Classified in class 502, subclass 34+.

Group II- Claims 13-21, drawn to a process for isomerizing an olefinic feedstock using a

catalyst classified in class 585, subclass 64+.

In a telephone conference with Examiner, Thuan Dang on June 21, 2002 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-12. Affirmation of this election is made herein.

TRAVERSE

The Office Action states as follows:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. (MPEP §806.05 (h)). In the instant case, the product as claimed can be used in a materially different process of using that product, such as the process of disproportionation of paraffins.

However, claim 1 is directed to and recites a basic metal oxide double bond isomerization catalyst. Claim 13 is directed to a process for the isomerizing an olefinic feedstock. No mention is made of the disproportionation of paraffins, nor has the Examiner provided any evidence that a catalyst effective for isomerization of olefins is also suitable for disproportionation of paraffins.

Moreover, step (b) of claim 13 recites activating a metal oxide olefin isomerization catalyst in a manner which is substantially the same as recited in claim 1. Thus, the search for claim 13 and Group II claims would also encompass a search for claim 1 and the Group I claims.

Accordingly, it is respectfully submitted that both Group I and II claims should be examined and prosecuted on the merits in the present application. Withdrawal of the Restriction Requirement is respectfully requested.

The Rejections

1. Claims 10-12 are rejected under 35 U.S.C. §102(b) as being anticipated by or, alternatively, under 35 U.S.C. §103(a) as being obvious over, U.S. Patent No. 4,778,943 (hereinafter, "Sun"). Claim 10 is directed to a basic metal oxide catalyst for double bond isomerization treated in accordance with the process of claim 1.

Sun discloses a process for the skeletal isomerization of olefins by contacting the olefins with an alkaline earth oxide catalyst which has been treated with a halogen compound.

Claim 10 is amended herein to additionally recite that the catalyst has substantially no activity-affecting amount of water or carbon dioxide and that the catalyst is for double bond isomerization. Support for this recitation can be found, for

example, at page 11, lines 3-7, page 2 lines 6-10, and page 4, lines 1-11 of Applicants' specification. As stated at page 10, lines 17-24, water and carbon dioxide are believed to cause acid sites in the catalyst which promote fouling reactions that limit the on-stream cycle life of the system. That is, water and carbon dioxide are catalyst poisons for applicants' basic metal oxide double bond isomerization catalyst.

The Sun patent does not disclose the catalyst or process claimed by applicants. To the contrary, the Sun process is skeletal isomerization not double bond isomerization as contemplated by applicants. Double bond isomerization is directed to the shifting of the double bond within an olefinic compound. Skeletal isomerization is directed to the conversion of unbranched olefins to branched olefins, and employs acidic catalysts, which are excluded from the present invention. For example, the Sun process contacts the catalyst with halogen acidic compounds. (Col. 2, lines 16-25.) About 0.05% to 25% of the Sun catalyst is halogen. Therefore, the Sun patent requires for skeletal isomerization what would be a poison for applicants' catalyst.

Accordingly, claim 10 as amended and claim 11, are neither anticipated by nor obvious over the Sun patent. Reconsideration and withdrawal of the rejection of claims 10 and 11 under 35 U.S.C. §102(b)/103(a) are respectfully requested.

2. Claims 1-7 are rejected under 35 U.S.C. §103(a) as being obvious over Sun taken together with U.S. Patent No. 5,953,911 (hereinafter, "Guth"). Claim 1 as amended is directed to a process for activating a basic metal oxide double bond isomerization catalyst.

Applicants respectfully submit that there is no basis for combining Sun and Guth, and that neither of these patents relate to the process claimed by applicant.

Sun is directed to an olefin skeletal isomerization process, which is distinguished from double bond isomerization as described above, and discloses the use of a magnesium oxide catalyst pretreated with a halogen compound. The Guth patent is directed to the regeneration of a deNOx catalyst/absorber mixture. The Guth catalyst is an oxidation catalyst of noble or transition metals. Alkali or alkaline earth compounds are used as absorbers of the nitrogen oxides produced by the oxidation catalyst. The Office Action states:

There is a motivation to combine the teachings of the Guth reference with the Sun reference because Guth teaches his catalyst also contains alkaline earth metal compounds (see Guth at col. 4, ln 36-37).

Applicants respectfully disagree with this conclusion. Guth discloses that alkaline earth compounds can be used as absorbers. However, Guth does not disclose basic metal oxides or the use of basic metal oxides as catalysts. Regeneration for

the purpose of restoring absorption activity does not necessarily relate to regeneration for the purpose of restoring catalytic activity. The technical fields of the Guth and Sun patents are entirely different. Therefore, one skilled in the art would find no suggestion for combining their teachings.

Moreover, Guth states that in the regeneration gas "...up to one percent oxygen may be present without significant negative effects." This is inconsistent with Applicants' teachings and the recitations of claim 1 herein which limits the amount of oxygen to no more than 5 ppm. Neither Guth nor Sun disclose the criticality of this limitation. And Guth further states that steam is a good carrier in concentrations of 30% to 98% with the balance being nitrogen. Guth, col. 3, lines 26-27. This is contrary to applicants' recitation of the use of dry inert gas.

Neither Guth nor Sun relate to double bond isomerization and there is no disclosure or suggestion in either of these patents of a process for activating a double bond olefin isomerization catalyst. The combination of the teachings of Guth and Sun would result in a poisoning of the catalyst for the purposes of double bond isomerization.

Moreover, Applicants have provided data which rebut any inference of obviousness. Referring to Example 1 (pages 15-17 of the specification) it can be seen that activating a

magnesium oxide catalyst with dry nitrogen which had been passed through an oxygen adsorption guard bed to reduce the oxygen content to 1 ppm produced a catalyst with a deactivation rate less than one-third that of a magnesium oxide catalyst which had been activated with nitrogen from a conventional source which had a higher level of oxygen (10 ppm).

These results are surprising. Nothing in either of the cited references discloses or suggests the advantageous increase in catalyst life by reducing the level of oxygen to below 5 ppm in the activation gas.

Accordingly, it is respectfully submitted that claim 1, and all claims depending therefrom, are allowable over the cited references. Reconsideration and withdrawal of the rejection of claims 1-7 are respectfully requested.

3. Claims 8-9 are rejected under 35 U.S.C. §103(a) as being obvious over Sun and Guth, and further in view of U.S. Patent No. 5, 573,988 (hereinafter, "Didillon").

One skilled in the art would not find any suggestion to combine the teachings of Didillon and Sun. Didillon discloses a single step oxychlorination method which employs regeneration gas containing both a halogen compound and molecular oxygen. (Didillon, col. 2, lines 62-67). The Didillon catalyst is a dehydrogenation and/or dehydrocyclization

catalyst comprising a metal element (e.g., platinum) on a refractory oxide (e.g., magnesium oxide) support. Sun, on the other hand, is directed to a skeletal isomerization catalyst. Sun employs a halogen compound but states that the halogen treatment "...should be performed in a non-oxidizing atmosphere to prevent halide oxidation." (Sun, at col. 2, lines 35-36). Thus, the teaching of Sun explicitly excludes combination with the process disclosed in Didillon.

It is respectfully submitted that even if the teachings of Didillon, Sun and Guth were to be combined, Applicants' invention as recited in claims 8 and 9 would not be disclosed or suggested. Claim 8 recites a decoking step which is performed prior to the activation step. Thus, claim 8 encompasses a two-step process of decoking with a dry gas containing at least about 2 percent oxygen, followed by activation with a dry inert gas containing not more than about 5 ppm oxygen. Regeneration by decoking and subsequent activation are two separate steps. Activation after regeneration is necessary because the decoking step is accomplished by the combustion of the coke deposits with an oxygen-containing gas, which produces the catalyst poisons carbon dioxide and water. These poisons are removed by the subsequent activation step. It is an important feature of the present invention that the dry inert gas used for activation of the catalyst contain as little

oxygen as possible. Hence, the advantageous use of an oxygen adsorption bed or other means to remove traces of oxygen present in conventional sources of nitrogen as described in the specification at page 12. None of the references disclose or even remotely suggest the two-step decoking-activation process as recited in applicants' claims.

Moreover, claims 8 and 9 are dependent from claim 1, which is submitted to be allowable for the reasons stated above. Accordingly, claims 8 and 9 are also submitted to be allowable.

Reconsideration and withdrawal of the rejection of claims 8 and 9 under 35 U.S.C. §103(a) are respectfully requested.

New Claims

New claims 22 and 23 are added herein. Claim 22 depends from claim 1 and further specifies that catalyst is for the conversion of internally olefinic compounds to alpha olefinic compounds (i.e., terminally olefinic compounds such as 1-butene, 1-pentene, etc.). Claim 23 is independent and is directed to a process for activating a metal oxide isomerization catalyst. Claim 23 explicitly states that the dry inert gas has been passed through an oxygen removal system. Support for this claim may be found in the specification at page 15, lines 3-14,

for example. These claims are even further distinguished over the art of record.

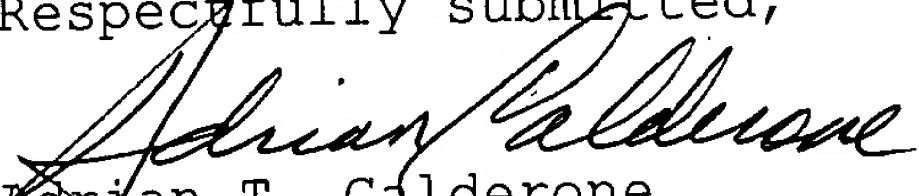
Other Matters

A supplemental Declaration is provided herein. In the originally filed Declaration there was a clerical error in the Title which erroneously stated "Method" instead of "Process". The corrected title is set forth in the supplemental Declaration.

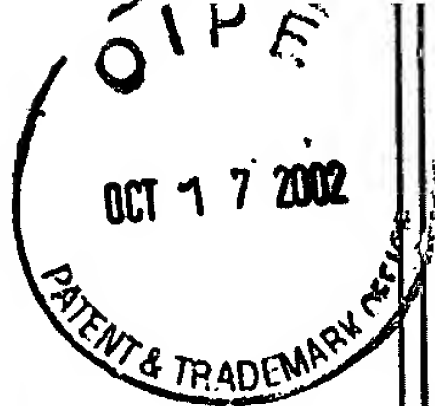
Conclusion

All of the examined claims are submitted to be patentable and in condition for allowance, the same being respectfully requested. Examination on the merits of the unelected claims is also respectfully requested.

Respectfully submitted,


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APPENDIX

Marked-Up Version of the Amendments

In the Specification

The paragraph at page 10, line 25 to page 11, line 2, is amended as follows:

A preferred catalyst for use in the olefin isomerization process is disclosed and described in the U.S. Patent Application Serial No. 09/863,973 [_____] filed concurrently herewith [(under Attorney Docket No. 1094-7)], which is herein incorporated by reference.

In the Claims

Claim 1 is amended as follows:

1. (Amended) A process for activating a basic metal oxide double bond isomerization catalyst which comprises at least one step of contacting the basic metal oxide catalyst under activation conditions with a dry inert gas containing not more than about 5 ppm molecular oxygen by volume.

Claim 10 is amended as follows:

10. (Amended) A basic metal oxide catalyst for double bond isomerization treated in accordance with the process of claim 1 and having substantially no activity-affecting amount of water or carbon dioxide.